WATER SUPPLY OUTLOOK
and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS
for
MONTANA & NORTHERN WYOMING

UNITED STATES DEPARTMENT of AGRICULTURE···SOIL CONSERVATION SERVICE,
and
MONTANA AGRICULTURAL EXPERIMENT STATION

AS OF
JAN. 1, 1962

Data included in this report were obtained by the agencies named above in cooperation with the Bureau of Reclamation, U.S. Forest Service, U.S. Geological Survey, National Park Service, State Engineers of Montana and Wyoming and other Federal, State, and private organizations.

UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

To Recipients of Cooperative Snow Survey and Water Supply Forecast Reports:

The climate of the cultivated and populated areas of the West is characterized by relatively dry summer months. Such precipitation as occurs falls mostly in the winter and early spring months when it is of little immediate benefit to growing crops. Fortunately, most of this precipitation falls as mountain snow which stays on the ground for months, melting later to sustain streamflow during the period of greatest demand during late spring and summer. Thus, nature provides in mountain snow an imposing water storage facility.

The amount of water stored in mountain snow varies from place to place as well as from year to year and accordingly, so does the runoff of the streams. The best seasonal management of variable western water supplies results from fore-knowledge of the runoff.

A snow survey consists of a series of about ten samples taken with specially designed snow sampling equipment along a permanently marked line, about 1000 feet in length, called a snow course. The use of snow sampling equipment provides snow depth and water equivalent values for each sampling point. The average of these values is reported as the snow survey measurement for a snow course.

Snow surveys are made monthly or semi-monthly beginning in January or February and continue through the snow season until April, May or June. Currently more than 1400 western snow courses are measured each year. These measurements furnish the key data for water supply forecasts.

By relating snow survey measurements taken over a period of years to spring-summer runoff during the same period, relationships have been developed which make it possible to forecast seasonal runoff several months in advance of occurrence. In order to make a forecast, once a forecast relationship has been developed, the maximum snow water content at previously selected key snow courses is usually entered in the forecast relationship. More accurate forecasts are often obtained when other factors such as soil moisture, base flow and spring precipitation are considered and included in the forecast relationships.

Listed below are the Federal-State-Private Cooperative Snow Survey and Water Supply Forecast reports available for the West which contain detailed information on snow survey measurements, streamflow forecasts, reservoir storage, soil moisture and other guide data to water management and conservation decisions.

PUBLISHED BY SOIL CONSERVATION SERVICE

REPORTS	ISSUED	LOCATION	COOPERATING WITH
RIVER BASINS			
COLORADO AND STATE OF UTAH	MONTHLY (JAN.-JUNE)	SALT LAKE CITY, UTAH	UTAH STATE ENGINEER AND OTHER AGENCIES
COLUMBIA	MONTHLY (JAN.-MAY)	BOISE, IDAHO	IDAHO STATE RECLAMATION ENGINEER
UPPER MISSOURI AND STATE OF MONTANA	MONTHLY (FEB.-JUNE)	BOZEMAN, MONTANA	MONT. AGR. EXP. STATION
WEST-WIDE	OCT. 1, APR. 1, MAY 1	PORTLAND, OREGON	ALL COOPERATORS
STATES			
ALASKA	MONTHLY (MAR.-MAY)	PALMER, ALASKA	ALASKA S.C.D.
ARIZONA	SEMI-MONTHLY (JAN.15 - APR.1)	PHOENIX, ARIZONA	SALT R. VALLEY WATER USERS ASSOC. ARIZ. AGR. EXP. STATION
COLORADO AND NEW MEXICO	MONTHLY (FEB.-MAY)	FORT COLLINS, COLORADO	COLO. AGR. EXP. STATION COLO. STATE ENGINEER N. MEX. STATE ENGINEER
IDAHO	MONTHLY (FEB.-MAY)	BOISE, IDAHO	IDAHO STATE RECLAMATION ENGINEER
NEVADA	MONTHLY (JAN.-MAY)	RENO, NEVADA	NEVADA DEPT. OF CONSERVATION AND NATURAL RESOURCES - DIVISION OF WATER RESOURCES
OREGON	MONTHLY (JAN.-JUNE)	PORTLAND, OREGON	ORE. AGR. EXP. STATION OREGON STATE ENGINEER
WASHINGTON	MONTHLY (FEB.-JUNE)	SPOKANE, WASHINGTON	WN. STATE DEPT. OF CONSERVATION
WYOMING	MONTHLY (FEB.-JUNE)	CASPER, WYOMING	WYOMING STATE ENGINEER

Copies of these various reports may be secured from:

Head, Water Supply Forecasting Section
Soil Conservation Service
P.O. Box 4170, Portland 8, Oregon

PUBLISHED BY OTHER AGENCIES

REPORTS	ISSUED	AGENCY
BRITISH COLUMBIA	MONTHLY (FEB.-JUNE)	COMPTROLLER, WATER RIGHTS BR., DEPT. OF LANDS AND FORESTS, PARLIAMENT BLDG., VICTORIA, B.C., CANADA
CALIFORNIA	MONTHLY (FEB.-MAY)	CALIF. DEPT. OF WATER RESOURCES, SACRAMENTO, CALIF.

FEDERAL-STATE-PRIVATE COOPERATIVE

SNOW SURVEYS AND WATER SUPPLY FORECASTS

for

MONTANA AND NORTHERN WYOMING

(Upper Missouri and Upper Columbia River Basins)

Report Prepared
By

A. R. Codd
Snow Survey Supervisor

and

P. E. Farnes
Ass't. Snow Survey Supervisor

Soil Conservation Service
Snow Survey Section
Box 855, Bozeman, Montana

Issued By

H. D. Hurd
State Conservationist
Soil Conservation Service
Bozeman, Montana

R. E. Huffman
Director
Montana Agricultural
Experiment Station
Bozeman, Montana

MONTANA
WATER SUPPLY OUTLOOK
as of
January 1, 1962

The Water Supply Outlook on January 1, 1962 is much better than last year and 20 to 40 percent above average. Snow surveys made at forty key stations indicate at this early date a good water supply is in the making.

Reservoir storage generally is good for January 1.

Soil moisture is considerably higher than last year.

SNOW COVER

Flathead River Basin

The January first snowpack measured at five courses in the Flathead River basin is 162 percent of last year and 134 percent of the average January first water content.

Clark Fork River Basin

Snowpack measured at six courses in the Clark Fork River basin is 151 percent of last year and 140 percent of the average January first water content.

Jefferson River above Sappington

January first water content at five snow courses measured in the Jefferson River is 121 percent of average and 36 percent more than last year.

Madison-Gallatin River Basin

January first snowpack measured at eight snow courses in the Madison-Gallatin River basin is 162 percent of last year and 134 percent of the average January first water content.

Yellowstone River Basin

Snow measurement at five courses on January first in the Yellowstone River basin is 72 percent more than last year and 138 percent of the average snowpack.

MONTANA
WATER SUPPLY OUTLOOK
as of
January 1, 1962

* *
* The Water Supply Outlook on January 1, 1962 is mixed * * Better than last year and 20 to 40 percent above * * average. Snow surveys made at forty key stations * * indicate at this early date a good water supply in * * the making. * * Reservoir storage generally is good for January 1. * * Soil moisture is considerably higher than last year. *

SNOW COVER

Flathead River Basin

The January first snowpack measured at five sources in the Flathead River basin is 102 percent of last year and 134 percent of the average January first water content.

Clark Fork River Basin

Snowpack averaged at six sources in the Clark Fork River basin is 134 percent of last year and 140 percent of the average January first water content.

Jefferson River above Sheridan

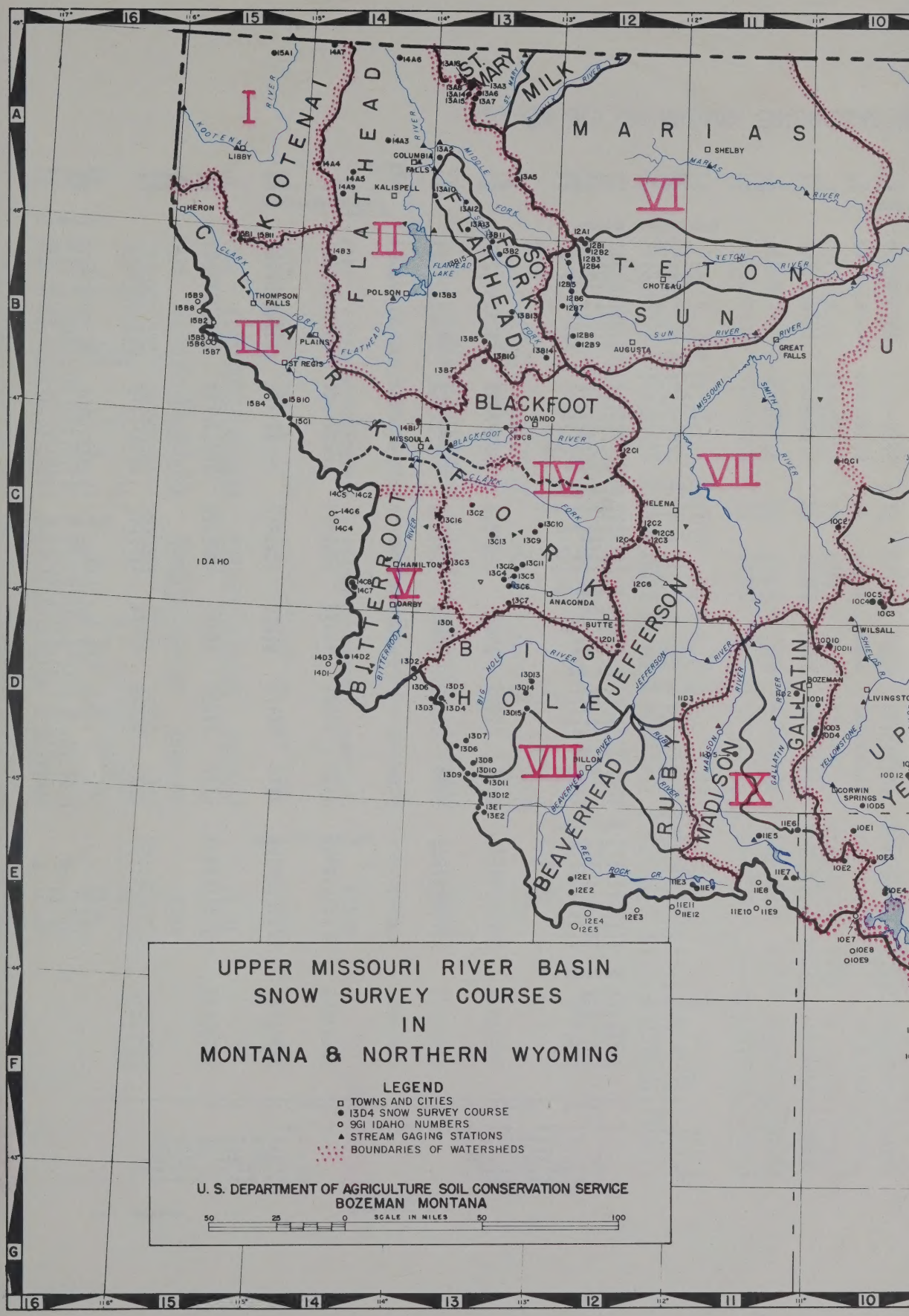
Average first water content at five snow sources measured in the watershed above is 127 percent of average and 34 percent more than last year.

Madison-Gallatin River Basin

January first snowpack averaged at eight snow sources in the Madison-Gallatin River basin is 107 percent of last year and 134 percent of the average January first water content.

Yellowstone River Basin

Snow measurements at five sources on January first in the Yellowstone River basin is 94 percent from that last year and 130 percent of the average snowpack.


UPPER MISSOURI RIVER BASIN
SNOW SURVEY COURSES
IN
MONTANA & NORTHERN WYOMING
LEGEND
TOWNS AND CITIES
13D4 SNOW SURVEY COURSE
9G1 IDAHO NUMBERS
STREAM GAGING STATIONS
BOUNDARIES OF WATERSHEDS
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE
BOZEMAN MONTANA
SCALE IN MILES
KOOTENAI
FLATHEAD
ST. MARY
MILK
MARIAS
TETON
SUN
CLARK FORK
BLACKFOOT
BITTERROOT
BIG HOLE
JEFFERSON
BEAVERHEAD
RUBY
MADISON
GALLATIN
YELLOWSTONE
IDAHO
LIBBY
HERON
COLUMBIA FALLS
KALISPELL
POLSON
THOMPSON FALLS
PLAINS
ST REGIS
MISSOULA
OVANDO
HELENA
HAMILTON
DARBY
ANACONDA
BUTTE
DILLON
SHELBY
CHOTEAU
AUGUSTA
GREAT FALLS
WILSALL
BOZEMAN
LIVINGSTON
CORWIN SPRINGS

MONTANA
WATER SUPPLY OUTLOOK
as of
January 1, 1962

* *
*
* The Water Supply Outlook on January 1, 1962 is known as
* better than last year and 20 to 40 percent above
* average. Snow surveys made at forty key locations
* indicate at this early date a good water supply in
* in the making.
*
* Reservoir storage potential is good for January 1.
*
* Soil moisture is considerably higher than last year.
* *

AREA NOTES

Flathead River Basin

The January first snowpack measured at five sources in the Flathead River basin is 102 percent of last year and 134 percent of the average January first water content.

Clark Fork River Basin

Snowpack measured at six sources in the Clark Fork River basin is 123 percent of last year and 140 percent of the average January first water content.

Jefferson River Drainage

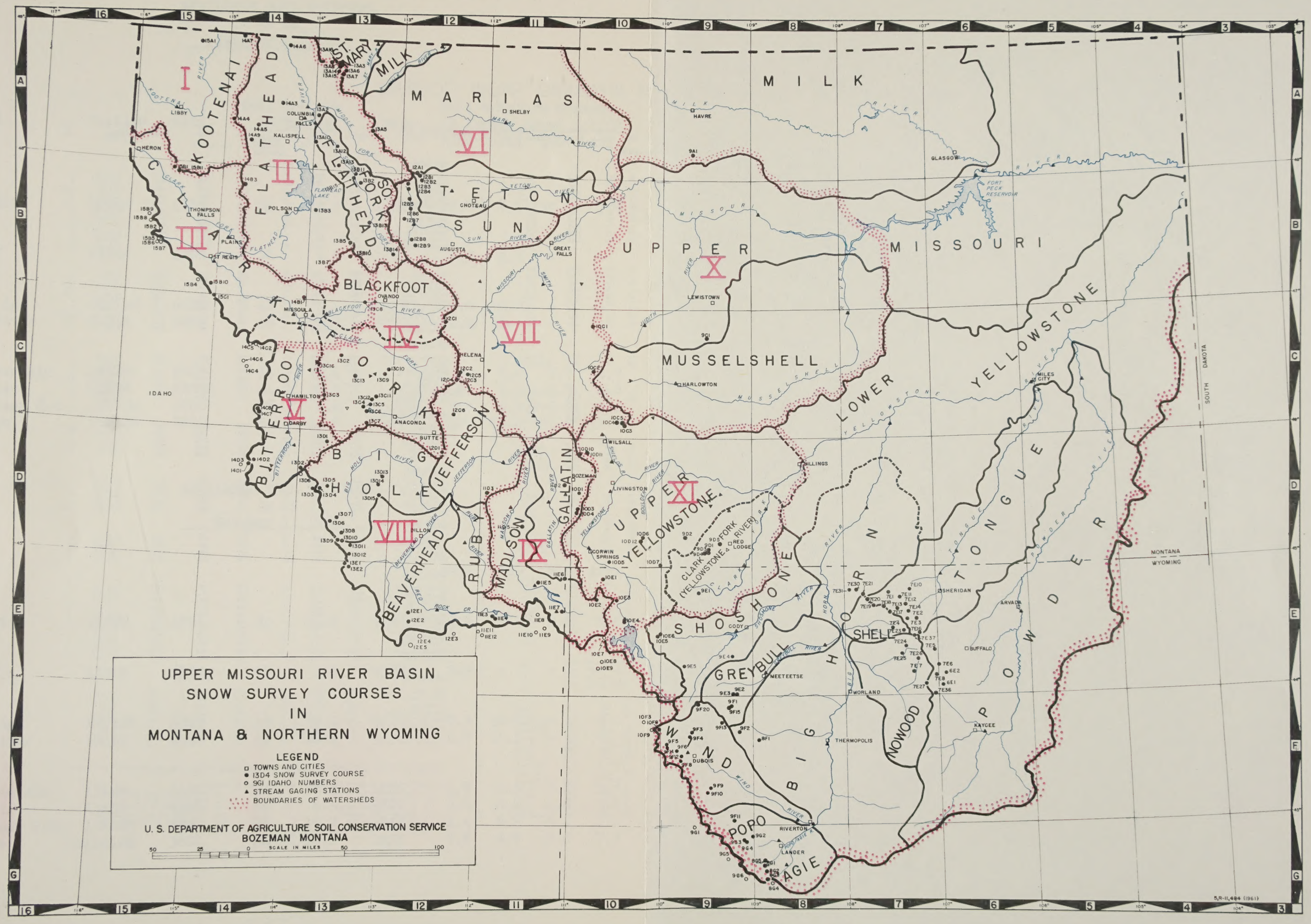
January first water content of five snow courses measured in the Jefferson River is 127 percent of average and 78 percent more than last year.

Madison-Gallatin River Basin

January first snowpack measured at eight snow courses in the Madison-Gallatin River basin is 132 percent of last year and 134 percent of the average January first water content.

Yellowstone River Basin

Snow measurements at five sources in Montana's first in the Yellowstone River basin is 101 percent over last year and 128 percent of the average January.


UPPER MISSOURI RIVER BASIN
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JEFFERSON
GALLATIN
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MADISON
RUBY
BEAVERHEAD
SHOSHONE
GREYBULL
WIND
POPO AGIE
BIG HORN
MUSSELSHELL
LOWER YELLOWSTONE
TONGUE
POWDER
MOWOOD
IDAHO
SOUTH DAKOTA
MONTANA
WYOMING
FORT PECK RESERVOIR
LIBBY
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COLUMBIA FALLS
POLSON
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PLAINS
ST REGIS
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MISSOULA
OVANDO
HELENA
HAMILTON
DARBY
ANACONDA
BUTTE
WILSALL
BOZEMAN
LIVINGSTON
DILLON
CORWIN SPRINGS
RED LODGE
BILLINGS
MILES CITY
SHERIDAN
ARVADA
BUFFALO
KAYCEE
THERMOPOLIS
WORLAND
GODY
MEETEETSE
DUBOIS
RIVERTON
LANDER

MILK
HAVRE
GLASGOW
FORT PECK RESERVOIR
MISSOURI
EWISTOWN
SSELSHELL
LOWER
YELLOWSTONE
MILES CITY
SOUTH DAKOTA
BILLINGS
TONGUE
POWDER
MONTANA
WYOMING
SHERIDAN
ARVADA
BUFFALO
CODY
SHOSHONE
SHELL
HORN
GREYBULL
MEETEETSE
WORLAND
BIG
NOWOOD
KAYCEE
THERMOPOLIS
DUBOIS
WIND
RIVERTON
LANDER
POPO
AGIE
5,R-11,484 (1961)

AVAILABLE SOIL MOISTURE
As of
January 1, 1962

Drainage Basin and Station	Station No.	Elev.	Soil Profile in Inches Depth	Soil Profile in Inches Cap.	Date	Soil Moisture Content in Inches About 1/1/62 1962	1961	1960	Avg.
GALLATIN									
College Site	11D2M	4856	54	14.5	12/29	10.7	7.1	10.3	7.8
MADISON									
Red Bluff	11D4M	4900	40	4.7	1/3	2.8	1.2	-	-
SHIELDS									
Battle Ridge	10D11M	6020	48	15.4	12/30	13.0	10.7	-	-
Shields River	10C4M	5850	48	20.8	12/30	12.8	10.9	-	-
FLATHEAD									
Desert Mountain	13A2M	5600	54	8.4		N.R.	6.0	7.7	6.7
Marias Pass	13A5M	5250	54	6.5		N.R.	4.1	5.7	4.6
Spotted Bear R.S.	13B15M	3700	28	6.2	12/28	5.8	4.9	5.9	5.4
Trout Lake	13A12M	3600	54	12.7	12/29	13.0	12.4	11.9	11.7

AVAILABLE SOIL MOISTURE
As of
October 1, 1961

						1961	1960	1959	Avg.
GALLATIN									
College Site	11D2M	4856	54	14.5	9/29	9.1	5.8	8.6	5.8
MADISON									
Red Bluff	11D4M	4900	40	4.7	9/22	3.2	-	-	-
SHIELDS									
Battle Ridge	10D11M	6020	48	15.4	9/30	9.3	10.6	-	-
Shields River	10C4M	5850	48	20.8	9/30	8.7	11.5	-	-
FLATHEAD									
Desert Mountain	13A2M	5600	54	8.4	10/5	4.9	4.5	7.2	5.8
Marias Pass	13A5M	5250	54	6.5	9/26	3.6	2.8	4.9	3.8
Spotted Bear R.S.	13B15M	3700	28	6.2	10/5	4.4	0.9	5.2	3.1
Trout Lake	13A12M	3600	54	12.7	10/5	7.8	6.9	9.8	7.7

INDEX TO MONTANA & NORTHERN WYOMING SNOW COURSES

COLUMBIA RIVER BASIN

Drainage Basin & Course Name	Number	Elev.	Location Sec. Lat.	Twp.	Range Long.	Record Began	Measuring Dates	Meas. By
KOOTENAI RIVER								
Baree Creek	15B11	5500	6	25N	30W	1937	4,5,5½	2
Brush Creek	14A4	5000	13	30N	26W	1937	3,4,5	1
Red Mountain	15A1	6000	4	36N	29W	1937	3,4,5,5½	1
Weasel Divide	14A7	5450	8	37N	24W	1937	3,4,5,5½	1
FLATHEAD RIVER								
Basin Creek	13B14A	5000	11	19N	12W	1951	2,3,4,5	1
Bassoo Peak	14B3	5150	11	24N	25W	1960	3,4,5	1,5
Big Creek	13B3	6750	7	22N	18W	1941	3,4,5, 6	1,5
Desert Mountain	13A2M	5600	24	31N	19W	1937	1,2,3,4,5	1,2
Griffin Creek Divide	14A9	5150	11	28N	25W	1960	3,4,5	1,5
Hell Roaring Divide	14A3	5770	35	32N	22W	1942	3,4,5	1
Holbrook	13B13A	4530	18	21N	13W	1951	2,3,4,5	1
Kishenehn	14A6	3886	14	37N	22W	1954	3,4	6
Logan Creek	14A5	4300	34	30N	24W	1937	3,4,5	1
Marias Pass	13A5M	5250	34	30N	14W	1934	1,2,3,4,5	3
Mineral Creek	13A16	4000	29	35N	17W	1939	3,4	6
North Fork Jocko	13B7	6330	3	17N	17W	1941	3,4,5, 6	1,5
Quintonkon	13A13	3800	11	26N	17W	1951	4	1,2
Spotted Bear Mt.	13B2	7000	23	25N	15W	1948	1,2,3,4,5	1,2
Strawberry Lake	13A10	6500	11	28N	19W	1948	3,4,5	2
Trinkus Lake	13B1	6500	9	25N	17W	1948	3,4,5	2
Trout Lake	13A12M	3600	21	28N	17W	1948	1,2,3,4,5	1,2
Twin Creeks	13B11	3580	14	26N	16W	1951	3,4,5	1,2
Upper Holland Lake	13B5	7000	28	20N	16W	1948	3,4,5	2
CLARK FORK RIVER								
Black Pine	13C13	7100	23	8N	15W	1959	3,4	1
Coyote Hill	13B10	4200	12	18N	16W	1947	1,2,3,4,5	1,2
El Dorado Mine	13C9	7800	23	8N	12W	1949	3,4	1
Fred Burr Pass	13C11	8000	12	6N	13W	1957	3,4	1
Freezeout Pass	15B10	6800	21	15N	27W	1937	4,5	1,2
Gold Creek Lake	13C10	7200	14	8N	12W	1949	3,4	1
Hoodoo Creek	15C1	6200	9	14N	27W	1937	4,5	1,2
Intergaard	13C4	6450	6	5N	13W	1936	2,3,4	4
Lubrecht Forest #6	13C8	4040	11	13N	14W	1951	1,2,3,4,5	8
Red Lion	13C12	7000	27	6N	13W	1958	3,4	1
Skalkaho Summit	13C3	7259	30	6N	17W	1937	3,4	1
Slide Rock Mt.	13C2	7100	35	10N	16W	1937	3,4	1
Southern Cross	13C5	6500	8	5N	13W	1936	2,3,4	4
Storm Lake	13C7	7780	19	4N	13W	1939	1,2,3,4,5	1
Stuart Mill	13C6	6500	19	5N	13W	1936	2,3,4	4
T.V. Mountain	14B1	6800	33	15N	19W	1956	1,2,3,4,5	1
BITTERROOT RIVER								
Ambrose	13C16	6475	28	9N	18W	1960	3,4,5	1
East Fork R.S.	13D1	5400	16	2N	17W	1937	3,4	1
Gibbons Pass	13D2	7100	4	2S	19W	1934	1,2,3,4,5	1,3
Lolo Pass	14C5	5230	11	10N	24W	1937	3,4,5	1,2
Lost Horse	14C7	5940	5	4N	23W	1960	3,4,5	1
Nez Perce Camp	14D2	5580	19	1S	23W	1937	3,4,5	1
Nez Perce Pass	14D1	6575	25	1S	24W	1937	3,4,5	1
Twin Lakes	14C8	6510	32	5N	23W	1960	3,4,5	1

SASKATCHEWAN RIVER BASIN

Drainage Basin & Course Name	Number	Elev.	Location Sec. Lat.	Twp.	Range Long.	Record Began	Measuring Dates	Meas. By
ST. MARY								
Iceberg Lake #3	13A3	5600	34	36N	16W	1922	5	3,9
Josephine Lower #9	13A14	4900	10	35N	16W	1955	5	3,9
Mount Allen #7	13A7	5700	22	35N	16W	1922	5	3,9
Piegan Pass #6	13A6	5500	15	35N	16W	1922	5	3,9
Ptarmigan #8	13A8	5800	32	36N	16W	1937	5	3,9

MISSOURI RIVER BASIN

Drainage Basin & Course Name	Number	Elev.	Location Sec. Lat.	Twp.	Range Long.	Record Began	Measuring Dates*	Meas. By
BEAVERHEAD RIVER								
Bloody Dick	13D10	7600	12	8S	16W	1948	3,4	1
Gold Stone	13D9	8100	11	8S	16W	1948	3,4	1
Lakeview Canyon	11E4	6930	26	14S	2W	1948	3,4,5	10
Lakeview Ridge	11E3	7400	27	14S	2W	1948	3,4,5	10
Lemhi Pass	13E1	7480	9	10S	15W	1948	3,4	1
Limekiln	12E2	6950	5	15S	9W	1948	3,4	1
Selway Junction	13D11	6800	27	8S	15W	1948	3,4	1
Terrell Creek	13D12	6650	14	9S	15W	1948	3,4	1
Trail Creek	13E2	7090	15	10S	15W	1948	3,4	1
White Pine Ridge	12E1	8850	18	14S	9W	1948	3,4	1
BIG HOLE RIVER								
Anderson Meadow	13D14	7000	18	3S	12W	1948	3,4	1
Below Big Hole Pass	13D4	6900	24	3S	18W	1948	3,4	1
Big Hole Pass	13D3	7240	28	3S	18W	1948	3,4	1
East Boundary	13D5	6700	22	3S	17W	1948	3,4	1
Elk Horn Springs	13D15	8450	15	4S	12W	1935	3,4,5	3
Jahnke Creek	13D8	7340	25	7S	16W	1948	3,4	1
Miner Forks	13D6	7300	24	6S	17W	1948	3,4	1
Miner Lake	13D7	6720	10	6S	16W	1945	3,4	1
Wise River	13D13	6300	15	2S	12W	1948	3,4	1
JEFFERSON RIVER								
Picnic Grounds	12C6	6500	10	5N	6W	1941	2,3,4	4
Pipestone Pass	12D1	7200	10	1N	7W	1938	1,2,3,4,5	1
MADISON RIVER								
Hebgen Dam	11E5	6550	22	11S	3E	1934	1,2,3,4,5	3
Jack Creek	11D5	7600	13	6S	1E	1961	3,4	1
Norris Basin	10E2	7500	44°44'		110°42'	1936	1,2,3,4,5	6
North Meadow	11D3	7500	23	3S	3W	1961	3,4	1
West Yellowstone	11E7	6700	34	13S	5W	1934	1,2,3,4,5	3
GALLATIN RIVER								
Devil's Slide	10D4	8100	14	5S	6E	1935	2,3,4,5	1
Hood Meadow	10D3	6600	22	4S	6E	1935	2,3,4,5	1
New World	10D1	6700	24	3S	6E	1939	2,3,4	1
Twenty-One Mile	11E6	7150	1	11S	5E	1934	1,2,3,4,5	3
MISSOURI RIVER MAIN STEM								
Chessman Reservoir	12C5	6200	2	8N	5W	1936	1,2,3,4,5	3
Crystal Lake	9C1	6100	19	12N	18E	1941	3,4	1
Grasshopper	10C2	7000	19	9N	8E	1938	3,4	1
Kings Hill	10C1	7950	35	13N	7E	1934	3,4,5	3
Rocky Boy	9A1	5200	15	28N	16E	1941	3,4	7
Stemple Pass	12C1	6900	16	13N	7W	1934	3,4,5	3
Ten Mile Creek L.	12C2	6250	13	8N	6W	1935	1,2,3,4,5	3
Ten Mile Creek M.	13C3	6800	13	8N	6W	1934	1,2,3,4,5	3
Ten Mile Creek, U.	12C4	8000	19	8N	5W	1935	1,2,3,4,5	3
SUN-TETON-MARIAS RIVERS								
Benchmark	12B8	5500	9	20N	10W	1948	3,4	1
Cabin Creek	12B6	5400	33	23N	10W	1949	3,4	1
Five-Bull	12B9	5600	36	20N	10W	1948	3,4	1
Freight Creek	12A1	6000	13	26N	10W	1948	3,4	1
Gates Park	12B5	5300	31	24N	10W	1949	3,4	1
Goat Mountain	12B7	7000	20	22N	10W	1934	3,4	1
Waldron Creek	12B2	5600	16	25N	9W	1948	3,4	1
West Fork	12B1	6000	6	25N	9W	1948	3,4	1
Wrong Creek	12B4	5700	32	25N	10W	1949	3,4	1
Wrong Ridge	12B3	6800	17	25N	10W	1949	3,4	1
MILK RIVER (Canada)								
Cress Day	10AA2	3450	49°-19'		110°-14'-15"	1953	4	9
Cypress Park	9AA1	4000	49°-39'		109°-31'-00"	1953	4	9
Elkwater	10AA1	4100	49°-40'		110°-15'-16"	1953	4	9
Val Marie	7AA1	2700	40°-19'		107°-43'-44"	1953	4	9
UPPER YELLOWSTONE RIVER								
Bald Ridge	10C5	7500	11	4N	10E	1961	3,4,5	1
Camp Senia	9D1	7890	2	8S	18E	1937	3,4,5	1
Canyon	10E3	7750	44°-44'		110°-30'	1938	1,2,3,4,5	6
Cooke City	10D7	7400	25	9S	14E	1937	1,2,3,4,5	6
Crevice Mt.	10D5	8400	22	9S	9E	1935	3,4	2
Gertrude Lake	9D3	9250	10	8S	18E	1961	3,4,5	1
Grizzly Peak	9D5	8400	26	7S	19E	1961	3,4,5	1
Independence	10D6	8000	22	7S	12E	1940	3,4,5	1
Lake Camp	10E4	7850	44°-34'		110°-24'	1936	1,2,3,4,5	6
Lodgepole	9E1	8200	32	56N	106W	1940	2,3,4,5	1,2
Lupine	10E1	7300	44°-54'		110°-37'	1938	1,2,3,4,5	6
Monument Peak	10D12	9000	22	7S	12E	1961	3,4,5	1
Porcupine R.S.	10C3	6500	10	4N	10E	1938	3,4,5	1
Timberline Creek	9D4	8850	10	8S	18E	1961	3,4,5	1
Sacajawea	10D10	6550	36	2N	6E	1960	3,4,5	1
West Rosebud	9D2	7500	10	7S	16E	1960	1,2,3,4,5	4

MISSOURI RIVER BASIN (WYOMING) (Continued)

Drainage Basin & Course Name	Number	Elev.	Location Sec. Lat.	Twp.	Range Long.	Record Began	Measuring Dates	Meas. By
WIND RIVER								
Big Warm	9F12	8800	36	42N	109W	1955	2,3,4,5	1
Burroughs Creek	9F4	8800	15	43N	107W	1948	2,3,4,5	1
Dinwoodie	9F10	10000	9	38N	105W	1948	2,3,4,5	1,5
Dinwoodie Glaciers	9F17	10500	3	38N	106W	1959	2,3,4	1
Dry Creek	9F9	9500	34	4N	105W	1948	2,3,4,5	1,5
DuNoir	9F6	8750	27	42N	108W	1940	2,3,4,5	1
Geyser Creek	9F7	8500	12	41N	108W	1948	2,3,4,5	1
Little Warm	9F8	9500	24	41N	108W	1948	2,3,4,5	1
Sheridan R.S. #2	9F14	7500	3	42N	109W	1955	2,3,4,5	1
T-Cross Ranch	9F3	8000	1	43N	107W	1940	2,3,4,5	1
Togwotee Pass	10F9	9600	29	44N	110W	1936	2,3,4,5	11
POPO AGIE RIVER								
Blue Ridge	8G2	9500	23	31N	101W	1939	2,3,4,5	1
Bruce's Camp	8G5	6500	24	32N	101W	1955	2,3,4	1
Hobb's Park	9G3	10000	22	2S	3W	1948	2,3,4,5	1,5
Mosquito Park	9G4	9500	23	2S	3W	1940	2,3,4,5	1,5
Sawmill Glade	8G1	8500	3	31N	101W	1939	2,3,4,5	1
South Pass	8G3	9000	13	30N	101W	1939	2,3,4,5	1
St. Lawrence R.S.	9F11	9000	26	1N	4W	1940	2,3,4,5	1,5
Trout Creek	9G2	8400	5	2S	2W	1948	2,3,4,5	1,5
Twenty Lakes	9G7	10500	2	1S	5W	1959	2,3,4	1
BIG HORN RIVER								
Five-Springs Falls	7E31	7500	19	56N	92W	1956	2,3,4,5	1
Kirwin	9F19	11000	13	45N	104W	1960	2,3,4	1
Medicine Wheel	7E30	9000	24	56N	92W	1956	2,3,4,5	1
Owl Creek	8F1	8700	36	43N	101W	1948	2,3,4,5	1
Wood River #2	9F15	8000	28	46N	103W	1956	2,3,4,5	1
Timber Creek #2	9E3	8800	25	47N	103W	1955	2,3,4,5	1
Frontier Needle	9F20	10000	20	46N	106W	1961	2,3,4	1
SHOSHONE RIVER								
Carter Mt.	9E4	7800	15	50N	103W	1957	1,2,3,4	1
East Entrance	10E6	7000	17	52N	109W	1948	1,2,3,4,5	6
Ishawooa Cone	9E5	9200	12	49N	108W	1960	2,3,4	1
Sylvan Pass	10E5	7100	12	52N	110W	1936	1,2,3,4,5	6
Younts Peak	9F18	8500	28	46N	108W	1960	2,3,4	1
NOWOOD CREEK								
Cold Springs Camp	7E25	8700	1	50N	86W	1956	2,3,4,5	1
Medicine Lodge Lakes	7E24	9500	7	51N	87W	1956	2,3,4,5	1
Onion Gulch	7E27	8100	31	48N	85W	1956	2,3,4,5	1
Tensleep Lake	7E26	9075	33	50N	86W	1956	2,3,4,5	1
Tyrell R.S.	7E35	8300	30	49N	86W	1956	2,3,4,5	1
SHELL CREEK								
Bald Mountain	7E21	9600	33	56N	91W	1956	2,3,4,5	1
Granite Pass	7E17	8950	19	54N	88W	1956	2,3,4,5	1
Ranger Creek	7E4	8800	32	53N	88W	1935	2,3,4,5	1
Shell Creek	7E23	9600	12	52N	88W	1956	2,3,4,5	1
TONGUE RIVER								
Beaver Tongue Div.	7E20	9200	12	55N	91W	1956	2,3,4,5	1
Big Goose #2	7E32	7700	4	53N	86W	1955	2,3,4,5	1
Bone Springs Div.	7E18	9200	32	55N	89W	1956	2,3,4,5	1
Burgess R.S. #2	7E33	7900	36	56N	89W	1955	2,3,4,5	1
Dome Lake #2	7E34	8800	11	53N	87W	1950	2,3,4,5	1
Gloom Creek	7E14	9300	32	55N	87W	1956	2,3,4,5	1
Sibley Lake	7E11	8000	10	55N	88W	1956	2,3,4,5	1
Sucker Creek	7E12	9000	19	55N	87W	1956	2,3,4,5	1
Steamboat Point	7E10	7500	32	56N	87W	1956	2,3,4,5	1
Wood Rock G.S.	7E13	8500	3	54N	88W	1956	2,3,4,5	1
Geneva Pass	7E37	10600	30	52N	86W	1961	2,3,4,5	1
POWDER RIVER								
Bear Trap	7F1	8000	10	45N	85W	1960	2,3,4,5	1
Canyon Creek	7F2	7400	16	43N	86W	1960	2,3,4,5	1
Clouds Peak	7E36	10000	15	51N	85W	1960	2,3,4	1
Muddy Creek G.S.	6E2	7800	2	48N	84W	1956	2,3,4,5	1
Munkres Pass	7E8	9700	11	48N	85W	1950	2,3,4,5	1
Soldier Park	7E5	8700	36	51N	85W	1950	2,3,4,5	1
Sour Dough	7E6	8500	17	49N	84W	1936	2,3,4,5	1
Tensleep R.S.	7E7	8300	30	49N	86W	1956	2,3,4,5	1

a. Numerals 1,2,3,4 and 5 refer to January 1, February 1, March 1, April 1 and May 1.

b. Numerals refer to Agency that secures the snow survey as follows:

1. Soil Conservation Service
2. U. S. Forest Service
3. U. S. Geological Survey
4. Montana Power Company
5. U. S. Indian Service
6. National Park Service
7. Montana Experiment Station
8. Montana State Forestry School
9. Dominion Water & Power Bureau
10. U. S. Fish and Wildlife Service
11. U. S. Bureau of Reclamation

M - Soil Moisture
A - Aerial Marker

5,R-11,484 - (1961)

USDA-SCS-LINCOLN NEBR 1961

AVAILABLE SOIL MOISTURE
As of
January 1, 1962

Drainage Basin and Station	Station No.	Elev.	Soil Profile in Inches Depth	Soil Profile in Inches Cap.	Date	Soil Moisture Content in Inches About 1/1/62 1962	1961	1960	Avg.
GALLATIN									
College Site	11D2M	4856	54	14.5	12/29	10.7	7.1	10.3	7.8
MADISON									
Red Bluff	11D4M	4900	40	4.7	1/3	2.8	1.2	-	-
SHIELDS									
Battle Ridge	10D11M	6020	48	15.4	12/30	13.0	10.7	-	-
Shields River	10C4M	5850	48	20.8	12/30	12.8	10.9	-	-
FLATHEAD									
Desert Mountain	13A2M	5600	54	8.4		N.R.	6.0	7.7	6.7
Marias Pass	13A5M	5250	54	6.5		N.R.	4.1	5.7	4.6
Spotted Bear R.S.	13B15M	3700	28	6.2	12/28	5.8	4.9	5.9	5.4
Trout Lake	13A12M	3600	54	12.7	12/29	13.0	12.4	11.9	11.7

AVAILABLE SOIL MOISTURE
As of
October 1, 1961

						1961	1960	1959	Avg.
GALLATIN									
College Site	11D2M	4856	54	14.5	9/29	9.1	5.8	8.6	5.8
MADISON									
Red Bluff	11D4M	4900	40	4.7	9/22	3.2	-	-	-
SHIELDS									
Battle Ridge	10D11M	6020	48	15.4	9/30	9.3	10.6	-	-
Shields River	10C4M	5850	48	20.8	9/30	8.7	11.5	-	-
FLATHEAD									
Desert Mountain	13A2M	5600	54	8.4	10/5	4.9	4.5	7.2	5.8
Marias Pass	13A5M	5250	54	6.5	9/26	3.6	2.8	4.9	3.8
Spotted Bear R.S.	13B15M	3700	28	6.2	10/5	4.4	0.9	5.2	3.1
Trout Lake	13A12M	3600	54	12.7	10/5	7.8	6.9	9.8	7.7

SNOW SURVEY DATA

AS OF JANUARY 1, 1962

(Inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
						WATER CONTENT	
NO.	NAME	ELEVATION	DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE
	COLUMBIA RIVER BASIN						
FLATHEAD RIVER							
13A2M	Desert Mountain	5600	1/2	35	9.5	6.0	6.4*
13A5M	Marias Pass	5250	1/3	36	9.9	6.2	8.1
13A13	Quintonkon	3800	12/28	39	9.4	-	-
13B2	Spotted Bear Mountain	7000	12/28	38	9.4	5.6	7.7*
13A12M	Trout Lake	3600	12/29	38	10.4	4.6	7.7*
13B11	Twin Creeks	3580	12/26	35	8.4	5.8	5.3*
CLARK FORK RIVER							
13B10	Coyote Hill	4200	1/2	30	8.2	3.6	5.0*
15B2	Lookout	5250	1/2	77	22.8	15.8	16.5*
13C8	Lubrecht Forest #6	4040	1/4	18	4.4	1.6	1.5*
13C7	Storm Lake	7780	12/27	28	6.3	5.4	6.6*
14B1	TV Mountain	6800	12/28	45	11.3	8.7	8.3*
BITTERROOT RIVER							
13D2	Gibbons Pass	7100	12/29	46	11.0	9.2	12.7*

NOTE: ALL AVERAGES BASED ON 1943-1957 (15 YEAR PERIOD). *ADJUSTED AVERAGE

SNOW SURVEY DATA

AS OF JANUARY 1, 1962

SNOW COURSE		CURRENT DATA				PRIOR YEARS		
No.	Name	Elevation	Date of Survey	Snow Depth	Water Content	Water content Last year	Average	Percent of average
	WATERSHED SUMMARY TABLE							
	Pitkin Creek Area							
1A01M	Sawtooth Mountain	5600	1/2	35	8.3	6.0	6.4	
1A02M	Pettyjohn Point	5250	1/2	35	9.0	5.2	8.1	
1A13M	Quicksand	3800	12/29	39	9.4	-	-	
1A02	Spectral Snow Mountain	7000	12/29	38	9.4	5.6	7.9	
1A01SM	Three Lakes	8600	12/29	35	10.4	6.8	7.2	
1A01T	Twin Springs	5250	12/29	33	8.4	5.8	5.2	
	Black River Area							
1A01D	Hogsback Mtn.	4200	1/2	30	8.9	3.4	5.9	
1A02	Tenmile	5950	1/2	27	12.8	10.3	16.5	
1A18	Lakeside Pond, Jr.	4000	1/4	24	4.8	3.4	1.9	
1A07	Pecos Lake	7700	12/27	28	6.3	3.4	5.6	
1A17	Ft Mountain	6500	12/28	45	11.3	4.7	6.2	
	Little Snake Area							
1A02	Nubbin Ridge	7100	12/29	46	14.0	4.3	12.4	

SNOW SURVEY DATA

AS OF JANUARY 1, 1962

(Inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
						WATER CONTENT	
NO.	NAME	ELEVATION	DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE
	MISSOURI RIVER BASIN						
BEAVERHEAD RIVER							
12E3	Camp Creek	6800	12/29	22	5.0	2.6	4.2*
11E12	Kilgore	6200	12/29	26	6.1	3.6	4.6*
12E4	Irving Creek	7035	12/29	14	3.4	2.0	-
12E5	Webber Creek	6700	12/29	14	2.9	2.0	-
JEFFERSON RIVER							
12D1	Pipestone Pass	7200	12/26	15	2.8	2.4	2.7*
MADISON RIVER							
11E9	Big Springs	6500	12/29	49	13.5	6.8	8.2
11E5	Hebgen Dam	6550	12/28	28	5.6	4.2	5.9
11E10	Island Park	6315	12/29	40	10.2	5.5	6.3
10E2	Norris Basin	7500	12/29	27	5.4	4.4	4.6*
11E8	Valley View	6500	12/29	37	9.0	4.8	5.8
11E7	West Yellowstone	6700	12/27	27	6.2	4.4	5.7
GALLATIN RIVER							
11E6	Twenty-One Mile	7150	12/27	42	10.3	7.0	8.6
MISSOURI MAIN STEM							
12C5	Chessman Reservoir	6200	1/3	9	1.9	0.8	2.2
12C2	Tenmile, Lower	6250	12/29	19	3.7	2.6	3.5
12C3	Tenmile, Middle	6800	12/29	27	5.4	3.5	5.3
12C4	Tenmile, Upper	8000	12/28	30	6.8	4.2	6.7
UPPER YELLOWSTONE RIVER							
10E3	Canyon	7750	12/29	38	8.6	4.9	6.3*
10D7	Cooke City	7400	1/1	25	4.8	3.6	4.0*
9D5	Grizzly Peak	8400	12/29	52	15.0	-	-
10E4	Lake Camp	7850	1/1	29	5.8	3.7	4.8*
10E1	Lupine Creek	7300	12/29	30	8.1	5.0	5.1*
10E7	Thumb Divide	7900	12/29	53	14.7	7.3	10.2*

NOTE: ALL AVERAGES BASED ON 1943-1957 (15 YEAR PERIOD). *ADJUSTED AVERAGE

SNOW SURVEY DATA

AS OF JANUARY 1, 1962

Station Number	Station Name	Elevation	Date of Survey	Snow Depth	Water Content	Last Year	Average
MISSOURI RIVER BASIN							
MONTANA AND ALBERTA							
12H13	Camp Creek	6300	12/29	22	5.0	2.6	4.2*
11K14	Elkhorn	6500	12/29	29	6.1	3.6	4.6*
12H24	Irving Creek	7021	12/29	14	2.4	2.0	-
12H23	Lobbyn Creek	6700	12/29	14	2.9	2.0	-
WYOMING AND UTAH							
09J23	Mirror Lake Dam	7300	12/28	15	2.2	2.4	2.0*
EASTERN STATES							
11A29	Air Station	6500	12/29	18	12.5	6.8	3.3
11B22	Hungry Dam	6550	12/28	22	3.4	4.1	2.9
11E10	Indian Peak	6315	12/29	40	16.2	5.5	6.3
11A12	Marcia Basin	7300	12/29	27	2.4	1.4	1.0*
11B4	Wet Dry View	6500	12/27	27	9.9	4.8	5.8
11A7	Wood Hollow	6700	12/27	27	6.2	4.4	5.7
SOUTHWEST STATES							
11B6	Tusayan-Oak Ridge	7150	12/27	41	10.3	7.0	4.9
NORTHERN MAIN STEM							
12H5	Gibbons Reservoir	6800	1/3	9	1.9	0.4	2.3
12H10	Tenmile, Lower	6140	12/29	19	4.7	2.6	3.5
12H3	Tenmile, Middle	6400	12/29	17	2.4	2.5	2.5
12H4	Tenmile, Upper	8000	12/29	30	8.8	4.2	6.7
NORTH TRIBUTARIES AREA							
12E3	Bowman	7100	12/29	35	8.0	4.9	6.3*
12G7	Cooke City	7400	1/3	25	2.2	3.8	4.0*
9H2	Gallatin Park	8400	12/29	32	15.0	-	-
12H6	Lake Creek	7000	1/3	29	2.8	2.7	4.2*
12G1	Lupine Creek	7300	12/28	30	8.1	3.0	3.1*
12E7	Tuwo Creek	7500	12/29	27	14.7	7.3	10.2*

*Average for 10 years only where available. *Calculated average.

RESERVOIR STORAGE
As of
December 31, 1961

BASIN	RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE - 1000 A. F. 1962	1961	1943-57 Average
COLUMBIA RIVER BASIN - MONTANA					
Flathead	Hungry Horse	3,428.0	2,992.0	3,423.0	2,883.0**
	Flathead Lake	1,791.0	1,367.0	1,260.0	1,257.1
	Camas 1/	45.2	-	22.1	23.8
	Mission Valley 2/	100.3	20.8	26.6	28.2
Clark Fork	Georgetown Lake	31.0	26.0	27.1	25.3
	Noxon	334.0	-	-	-
MISSOURI RIVER BASIN - MONTANA					
Beaverhead	Lima	84.0	-	10.4	32.4
Ruby	Ruby	38.8	-	13.2	22.7**
Madison	Hebgen Lake	345.0	106.8	129.2	240.3
	Ennis Lake	41.0	39.3	39.1	37.6
Gallatin	Middle Creek	8.0	19.6	2.8	3.1**
Missouri	Canyon Ferry	2,043.0	1,382.0	1,553.0	1,682.0**
	Hauser & Helena	61.9	52.0	60.1	54.9
	Lake Helena	10.4	7.0	9.8	8.3**
	Holter Lake	81.9	67.1	54.8	71.6
	Ackley Lake	5.8	-	4.3	4.2
	Durand	7.0	-	3.4	4.3
	Martinsdale	23.1	-	3.7	9.5
	Fort Peck	14,900.0	4,320.0	7,020.0	6,551.0
Sun-Teton	Gibson	105.0	34.0	32.6	55.5
	Willow Creek	32.3	10.3	14.6	18.4
	Pishkun	32.0	17.4	17.2	19.0
Marias	Lower Two Medicine	16.6	0	0	0
	Four Horns	19.2	14.5	14.7	8.6
	Tiber	1,316.0	642.8	622.4	626.2**
	Swift	30.0	15.5	11.3	18.1
	Lake Francis	112.0	74.8	78.3	94.4
Milk	Fresno	127.2	15.9	29.5	66.6
	Nelson	66.8	16.8	43.6	37.2
	Lake Sherburne	66.1	13.0	-	16.3
Yellowstone	Mystic Lake	20.8	13.9	14.9	14.5
	Tongue River	68.0	39.9	6.8	7.9
	Cooney	27.5	15.0	-	8.8

1/ Sum of four small reservoirs on west side of Flathead Lake.
2/ Sum of eight small reservoirs in Mission Valley not including Jocko Lake.
** Average for period of record.

RESERVOIR STORAGE
As of
September 30, 1961

BASIN	RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE - 1000 A. F. 1962	1961	1943-57 Average
COLUMBIA RIVER BASIN - MONTANA					
Flathead	Hungry Horse	3,468.0	2,002.0	3,423.0	2,883.0**
	Flathead Lake	1,791.0	1,367.0	1,260.0	1,257.1
	Swan 1/	45.2	-	22.3	23.8
	Ashley Valley 2/	100.3	20.4	26.6	22.3
Clark Fork	Georgetown Lake	31.0	26.0	27.2	25.3
	Noxon	334.0	-	-	-
MISSOURI RIVER BASIN - MONTANA					
Beaverhead	Clark	84.0	-	12.4	32.4
Big Hole	Maloney	32.8	-	23.8	32.7**
Madison	Hebgen Lake	343.0	106.8	329.2	240.3
	Ennis Lake	41.0	30.5	29.1	37.6
Gallatin	Middle Creek	9.0	19.6	2.8	3.3**
Missouri	Canyon Ferry	2,042.0	1,382.0	1,427.0	1,088.1**
	Tendoy & Clark Canyon	83.9	52.0	60.1	54.0
	Lake Helena	10.4	7.0	9.8	8.2**
	Holter Lake	81.9	67.1	34.8	71.6
	Ackley Lake	5.0	-	4.3	4.2
	Gibson	9.0	-	3.4	4.3
	Martinsdale	23.1	-	3.7	9.5
	Fort Peck	14,920.0	4,320.0	7,050.0	6,283.0
Sun-Teton	Pishkun	105.0	34.0	32.6	32.5
	Willow Creek	32.3	10.3	14.6	15.4
	Tiber	22.0	17.4	17.2	17.0
Marias	Lower Two Medicine	16.1	0	0	0
	Pine Ridge	19.2	14.5	14.7	8.4
	Tiber	1,270.0	422.8	629.4	600.2**
	Sweet	30.0	15.5	11.3	18.1
	Lake Frances	1,324.4	74.8	72.1	64.4
MILK	Fresno	127.3	15.9	20.7	23.6
	Nelson	64.8	16.6	4.3	27.2
	Lake Sherburne	64.1	13.8	-	16.3
Yellowstone	Pryor Lake	24.6	23.9	24.7	24.8
	Tongue River	68.0	20.0	8.8	9.0
	Bighorn	37.3	13.0	-	8.8

1/ Sum of four small reservoirs on west side of Flathead Lake.
2/ Sum of eight small reservoirs in Milk River Valley not including Nelson Lake.
** Average for period of records.

RESERVOIR STORAGE
As of
December 31, 1961

BASIN	RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE - 1000 A. F. 1962	1961	1943-57 Average
MISSOURI RIVER BASIN - WYOMING					
Wind	Bull Lake	152.0	95.6	57.1	80.4
	Pilot Butte	31.6	8.9	9.6	9.1
	Boysen	560.0AC	179.9	84.7	286.6**
Owl Creek	Anchor	16.5	0	-	-
Shoshone	Buffalo Bill	440.0	255.4	124.4	272.4
Belle Fourche	Key Hole	190.0AC	0	3.2	6.6**
MISSOURI RIVER BASIN - NORTH DAKOTA					
Missouri	Garrison	18,100.0AC	-	5,968.0	-
Heart	E.A.Patterson	5.6AC	2.0	3.5	3.7**
	Lake Tschida	68.7AC	34.8	50.0	52.3**
James	Jamestown	20.0AC	11.6	15.6	-
MISSOURI RIVER BASIN - SOUTH DAKOTA					
Missouri	Oahe	17,000.0AC	-	190.0T	-
	Fort Randall	3,800.0AC	-	2,373.7	1,556.0**
	Gavins Point	320.0AC	-	302.0	-
Grand	Shadehill	84.0AC	83.1	52.3	75.5**
Cheyenne	Angostura	90.0AC	3.4	2.0	43.2**
	Deerfield	15.1AC	3.3	2.1	11.0**
	Pactola	55.0AC	3.1	15.7	-
Belle Fourche	Belle Fourche	185.2AC	14.9	16.1	84.8

** Average for period of record.
AC Active Capacity USBR, Billings.
T Total storage.

Agencies Cooperating in Collecting Data Contained in this Bulletin

U. S. Forest Service
Region I, Missoula, Montana

U. S. Geological Survey
Helena, Montana

U. S. Army Corps of Engineers
Portland, Oregon
Seattle, Washington
Omaha, Nebraska
Riverdale, N. D.

U. S. Indian Irrigation Service
St. Ignatius, Montana

U. S. Weather Bureau
Helena, Montana

U. S. Fish & Wildlife Service
Red Rock Lakes Refuge
Monida, Montana

U. S. Bureau of Reclamation
Billings, Montana
Boise, Idaho

Montana Power Company
Butte, Montana

Agricultural Experiment Station
North Montana Branch Station
Havre, Montana

Montana State Highway Dept.
East Glacier, Montana

National Park Service
Yellowstone National Park
Glacier National Park

Montana Experiment Station
Montana State College
Bozeman, Montana

Bonneville Power Administration
Portland, Oregon

Montana State School of Forestry
Montana State University
Missoula, Montana

Soil Conservation Service
Montana, Wyoming, Idaho

Soil Conservation Districts
Montana Counties

Johnson Flying Service, Inc.
Missoula, Montana

Water Rights Branch
Dept. of Lands & Forests
Victoria, British Columbia

Department of Northern Affairs
& National Resources
Calgary, Alberta

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COOPERATIVE SNOW SURVEYS

Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro-electric power generation, navigation, mining and industry

"The Conservation of Water begins with the Snow Survey"